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PUBLICATIONS AND PATENTS

JANUARY - JUNE 1948

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BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

No.

ARTICLES AND ADDRESSES

Apparatus, Analytical Methods, and Techniques

1 NELSON, Mary L., and CONRAD, Carl M.

IMPROVEMENTS IN THE ACID-HYDROLYSIS METHOD OF DETERMINING THE CRYSTALLINITY OF CELLULOSE. Textile Research J. 18 (3), 149-54 (1948).

Problems complicating experimental application of the acid-hydrolysis technique were investigated with a view to their elimination. One of these problems -- deposition on the hydrolysis residues of small amounts of insoluble humic substances -- considerably increased the mathematical calculations necessary to determine the degree of crystallinity (defined as the amount of crystalline cellulose expressed as a decimal fraction of total cellulose). Therefore, development of a technique for chemically removing these humic substances was undertaken. Solution in 50-percent aqueous monoethanolamine proved satisfactory in the experiments. Its effectiveness was further demonstrated by comparing the amount of residue extracted, and also the degree of crystallinity obtained, with results shown by other methods.

Additional experiments were directed at finding a satisfactory preliminary purification treatment for cellulose that would not change the crystallinity value. Two-hour extraction with either boiling 1-percent sodium hydroxide or boiling monoethanolamine appeared to give the desired results.

On the basis of these studies, a revised procedure for crystallinity determinations is suggested.

2 KETTERING, James H.

DETERMINATION OF THE RATE OF WATER ABSORPTION OF LIGHT-WEIGHT COTTON FABRICS. Am. Dyestuff Reptr. 37 (3), 73-5 (1948).

A simple, rapid procedure is suggested for determining the rate of water absorbency of light-weight fabrics, and the necessary apparatus is described. The method consists essentially of determining the time required for a disc of test fabric to absorb a measured volume of water from the surface of a porous plate. It gave fairly reproducible results in the hands of different operators and compared favorably with two other widely used methods for measuring absorbencies.

No.

3 LAMBOU, M. G., CONDON, M. A., JENSEN, E., ANDREWS, F. R., and ALTSCHUL, A. M.

A RAPID METHOD FOR THE MEASUREMENT OF THE INHIBITION OF DETERIORATION IN INTACT SEEDS. Plant Physiology 23 (1), 84-97 (1948).

Previous experiments indicated the possibility of inhibiting by chemical treatment the biological activity which causes deterioration of seed during storage. This clearly demonstrated the need for finding new compounds that would be active in small concentrations. In the past only a few chemicals had been tried because of the length of time necessary to test their efficiency. Under ordinary conditions of storage, for instance, to measure the inhibitory action upon lipolysis in cottonseed at room temperature requires several months before conclusive results can be obtained.

In order to survey a wide variety of chemicals for inhibitory efficiency, a method was developed for rapidly evaluating a large number of potential inhibitors simultaneously. This method, applying in the laboratory experimental conditions which approximate those existing during commercial storage, permits a quantitative evaluation not only of the biological activity but also of the quality of the seed after storage. By setting up the effect produced by one inhibitor as a standard and comparing the other chemicals to this standard, it was further possible to assign an inhibitor index to any chemical investigated.

Application of this method in investigating the effects of ethylene chlorhydrin and vinyl propionate on heating and lipolysis in flaxseed is described in detail.

4 SMITH, Herbert O., MURPHY, Alton L., and GOLDTHWAIT, Charles F.

AN ORIFICE TEST TO EVALUATE YARNS FOR SWELLING-TYPE WATER-RESISTANT FABRICS. Textile Research J. 18 (2), 124-9 (1948).

A detailed description is given of the apparatus and test procedure used in applying the Southern Regional Research Laboratory's method for comparing the swelling or closing capacities of textile fibers and yarns through the use of orifices. Essentially, the test (mentioned but not described in previous articles) measures the seepage of water under pressure through a bundle of yarn packed tightly in an orifice. It has been applied successfully to yarns from different cottons, to yarns modified by mercerization or other chemical treatment, to cotton yarns whose swelling has been supplemented by the addition of swellable but insoluble materials, and to a lesser extent to yarns made from other cellulose fibers.

No.

Cotton and Cotton Products

5 EVANS, Robert B., and MEADOWS, Barkley

TRENDS IN THE CONSUMPTION OF FIBERS IN THE UNITED STATES 1892-1946. Preliminary Edition. Multilithed. ACE-93 Revised, 108 pp. (1948).

This report presents statistical data on consumption in the United States during the years 1892-1946 of the following textile and cordage fibers: cotton, wool and related fibers (including mohair, camel's hair, etc.), silk, flax, rayon, other synthetic fibers, jute, the various hard fibers, and hemp. Trends are discussed separately on the basis of mill consumption of raw fibers and of final consumption by ultimate consumers. Data on per capita consumption, exports and imports also are presented. The body of the report contains 10 charts and about 14 key tables. In addition, there is a statistical appendix composed of 60 classified tables. Late revisions, as well as preliminary figures for 1947, are included in supplementary form.

6 EVANS, Robert B., and MEADOWS, Barkley

FIBER CONSUMPTION SHOWS COTTON DOMINANCE, RAYON RISE. Textile World 98 (3), 129, 131, 233-4, 238 (1948).

Attention is called to the main trends in total consumption of fibers in the United States during the past 50 years, as indicated by a detailed statistical study (see No. 5) to which has been added some preliminary data for 1947. A marked upward trend from the 1890's to World War I was followed by only a slight rise until 1939, when consumption began a rapid climb toward the all-time high reached during World War II. Consumption turned down again after 1943, then went up slightly in 1946 to set a new record for peacetime. Preliminary estimates place consumption for 1947 around 6.7 billion pounds.

Trends are traced individually for cotton, rayon, wool, silk, flax, jute and the hard fibers. These show that cotton's share of the total textile market has declined in recent years while rayon and other synthetic fibers gained rapidly. However, cotton remains by far the most important fiber in the textile economy of the United States.

7 EVANS, Robert B.

SYNTHETIC FIBERS AND PAPER AS COMPETITORS OF COTTON. Study of Agricultural and Economic Problems of the Cotton Belt. Hearings Before Special Sub-Committee on Cotton of the Committee on Agriculture. House of Representatives, 80th Congress, 1st Session, Part II. 979-87 (1948).

Although cotton still supplies the fiber for more than 60 percent of our textile requirements, it has been losing important end-use markets during the past 15 years to rayon and paper. Greatly intensified competition from these materials, as well as from several new synthetic fibers, is in prospect.

In the past, cotton has been preferred to other fibers largely because it offered the consumer unusually excellent properties at a comparatively low price. It was the world's best buy as a textile raw material. Today, some of cotton's advantages in quality have been equalled by competitive materials, and others are under constant attack in the research laboratory. The price of cotton rose during and after the war until now it is out of line -- at a time when cotton needs a competitive price more than ever in order to hold its markets. Competitive prices must be supported by a well-directed, sustained research program and much more aggressive merchandising than cotton has had in the past. Only in this way can cotton hold its own in the face of increasing production of improved quality synthetic fibers and a larger variety of competing paper products, which are themselves the products of research.

The extent of present competition is discussed in detail for rayon, nylon, Vinyon, Saran, the casein and glass fibers, and for paper.

8 HONOLD, Edith, and WAKEHAM, Helmut

HYSTERESIS, ELASTIC MODULUS, AND GROWTH OF TIRE CORDS UNDER COMPARABLE LOADS. Ind. & Eng. Chem. 40 (1), 131-4 (1948).

The authors believe that any investigation of tire cords aimed at improving failure resistance should include tests under conditions as nearly like those of actual service as possible. In an effort to arrive at the best laboratory conditions for making such tests, consideration was given to the fact that in actual service tire cords frequently get very hot, yet retain a moderate amount of moisture. Using a method previously described, measurements were made of the hysteresis, elastic modulus, total growth, and growth rate of 14 typical tire cords of native cotton, mercerized cotton, rayon, and nylon at three conditions of moisture and temperature.

The data are summarized in three tables and two graphs. Results of the study are evaluated, and some possible significances of the properties measured are discussed.

9 JURGENS, Julian F., REID, J. David, and GUTHRIE, John D.

PHOSPHORYLATED COTTON CELLULOSE AS A CATION-EXCHANGE MATERIAL. Textile Research J. 18 (1), 42-4 (1948).

Methods of measuring cation-exchange capacities of 13 samples of cotton cellulose phosphorylated in various ways are discussed, and conclusions are summarized in a table. Some preliminary work was done on samples phosphorylated with phosphorus oxychloride and pyridine. It was found, however, that better results could be obtained with phosphoric acid and urea. Cotton cellulose treated by this method has a high-cation-exchange capacity and, when used in the form of a coarse fabric, shows good flow characteristics in the calcium-hydrogen cycle. Its cation-exchange capacity increases with the phosphorus content, reaching about 1,000 milliequivalents per kilogram when about 5 percent of phosphorus is present.

10 NELSON, Mary L., and CONRAD, Carl M.

EFFECT OF GRINDING ON THE CRYSTALLINITY OF CELLULOSE FIBERS, AS INDICATED BY THE ACID-HYDROLYSIS AND OTHER TECHNIQUES. Textile Research J. 18 (3), 155-64 (1948).

In order to study the effect of grinding in Wiley mills on the degree of crystallinity of cellulose fibers, as determined by the hydrolysis-residue method, samples of purified cotton linters and cut cotton were reduced to small particles by increasingly severe grinding. An analysis of the resulting material in a standard set of sieves indicated that the particles became definitely smaller as the severity of the grinding increased. Even mild-grinding -- through a 2-mm. opening, for instance -- affected the degree of crystallinity. The reduced crystallinity was accompanied by only a slight change in degree of polymerization in cases of the most severe grinding. Part of the crystallinity lost in grinding was regained when the samples were moistened and then allowed to dry.

Measurements of accessibility, heat of wetting, moisture, adsorption, and fluidity, for the most part, supported the interpretation that grinding caused an increase in the amorphous fraction at the expense of the crystalline fraction of cellulose, which is represented by a continuous network of more or less amorphous chains connecting crystalline areas.

Previous grinding studies are outlined, and the experimental procedure for the present study is given in detail. Some applications of the results to the explanation of cellulose structure are discussed.

11 SCHUYTEN, H. A., REID, J. David, WEAVER, J. W., and FRICK, John G. Jr.

IMPARTING WATER REPELLENCY TO TEXTILES BY CHEMICAL METHODS: AN INDEX OF COMPOUNDS USED. Mimeographed. AIC-179, 93 pp. (1948).

A list of the chemical compounds used as water-repellent agents is assembled and indexed to facilitate reference to patents or literature relating to the compound specifically of interest. References were collected through October 1947. Compounds cited particularly as water-repellent agents, as well as those mentioned as starting materials or intermediates, are included -- but not such simple reagents as water, ammonia, and hydrochloric acid. The compounds have been divided into 28 classes, which are presented in alphabetical arrangement followed by a section on miscellaneous compounds and a list of the references cited.

No.

12 SCHUYTEN, H. A., WEAVER, J. W., REID, J. David, and JURGENS, J. F.

TRIMETHYLSILYLCELLULOSE. J. Am. Chem. Soc. 70 (5), 1919-20 (1948).

A study is described which indicates the formation of definite compounds of cellulose with substituted silanes. The reaction of trimethylchlorosilane and other chloro- and acetoxysilanes with cellulose gave products which, by gain in weight and silicon content, showed a group substitution as high as 2.75 groups per glucose unit. When the change in weight was determined over a period of time, it was evident that the trimethylsilylcellulose thus formed is stable in dry air at room temperature but decomposes slowly at elevated temperatures or in the presence of atmospheric moisture. It may be readily hydrolyzed with boiling water or with dilute acids or alkalies, but is insoluble in the usual organic solvents and in mixtures of solvents such as are used in dissolving cellulose acetate and other cellulose derivatives.

13 SCOTT, Walter M.

FUNDAMENTAL AND APPLIED RESEARCHES REVEAL NEW HORIZONS FOR COTTON AND COTTONSEED. Study of Agricultural and Economic Problems of the Cotton Belt. Hearings Before Special Sub-Committee on Cotton of the Committee on Agriculture, House of Representatives, 80th Congress, 1st Session, Part II, 965-77 (1948).

Selection, organization and prosecution of various lines of research at the Southern Regional Laboratory are discussed. Basic to this research is the concept of cotton as a structural raw material with measurable dimensions and properties and a determinate molecular structure. More complete knowledge of these fundamental physical and chemical properties and their relation to service performance is necessary before they can be so modified or enhanced as to enable the textile manufacturer to select his raw cotton for specific end-uses as efficiently as a civil engineer, for example, selects certain types of steel for a particular bridge. Some of the Southern Laboratory's contributions to this objective are discussed briefly.

14 SCOTT, Walter M.

RESEARCH AS AN AID TO COTTON AND COTTONSEED IN MAINTAINING MARKETS. Address, Third State-Wide Conference and Annual Meeting of the Texas Chemurgic Council at Corpus Christi, Texas, April 2. Mimeographed. AIC-185, 8 pp. (1948).

In this address Dr. Scott identified the aim of research in the U. S. Department of Agriculture's regional laboratories with the definition of chemurgy, then outlined the role of the Southern Laboratory in increasing industrial utilization of cotton and cottonseed.

He said future markets depend both on discovery of new uses and maintenance of present uses in undiminished volume. Cotton and cottonseed must compete favorably with other products in both quality and price. The Southern Regional Research Laboratory has made definite strides in this direction by, among other things, finding ways to improve the rot resistance of cotton fiber, protect cotton fabrics from light degradation, increase the durability of cotton tire cord by chemical treatment, and differentiate between mature and immature cottons by means of a special dye test.

The Southern Laboratory has pioneered in experimental solvent extraction of cottonseed, seeking to evaluate the advantages and disadvantages of this method in developing better quality products. Attention also is directed toward a greater understanding of the unique system of pigments which complicates the processing of cottonseed. Better storage methods are being developed to reduce loss of cottonseed through spoilage.

SEE ALSO NOS. 1, 2 and 4.

Cottonseed, Peanuts, Rice, and Derived Products

15 ALTSCHUL, Aaron M.

*BIOLOGICAL PROCESSES OF THE COTTONSEED. Chapter V, pp. 157-212, in Cottonseed and Cottonseed Products, Their Chemistry and Technology ed. by Alton E. Bailey, Interscience Pub., N.Y. (1948).

Biological activity in cottonseed is discussed in terms of specific chemical and physical reactions and also with respect to its economic significance. The general properties of viable seeds, and the biochemical methods used for studying them, are outlined. Hygroscopic equilibrium, germination, heating, respiration and lipolysis are discussed in detail with respect to methods of measurement and control. A section of the chapter is devoted to deterioration of seeds both in the field and in storage. Suggestions are made for minimizing or preventing this deterioration.

16 ARTHUR, Jett C. Jr., and KARON, Melvin K.

PREPARATION AND PROPERTIES OF COTTONSEED PROTEIN DISPERSIONS. J. Am. Oil Chemists' Soc. 25 (3), 99-102 (1948).

Industrial utilization of cottonseed meal and protein heretofore has been retarded because the extracted proteins were not appreciably dispersible in aqueous alkali solutions below pH 11.7. This report describes an investigation of methods for preparing nongelling dispersions of cottonseed proteins which have good tackiness and desirable viscosities for industrial use.

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*This publication not available for distribution.

Dispersions were prepared with the aid of anions such as trichloroacetate, borate, citrate, and nitrate. It was found that the properties of isolated cottonseed protein depend on the method used to isolate it, the concentration of protein in the dispersion, the concentration of sodium hydroxide used to disperse the protein, and the addition of trichloroacetate ion to prevent gelation. Effects of the trichloroacetate ion on aqueous cottonseed protein dispersions are summarized in two tables and two charts. Apparatus used in the experiment is described in detail.

17 BOATNER, C. H., ALTSCHUL , A. M., IRVING, G. W. Jr. POLLARD, E. F. (with SCHAEFER, H. C., of the Ralston Purina Company, St. Louis, Missouri)

THE NUTRITIVE VALUE OF COTTONSEED FOR CHICKS AS AFFECTED BY METHODS OF PROCESSING AND CONTENT OF PIGMENT GLANDS. Poultry Science 27 (3), 315-28 (1948).

A report is made of the effect on growth of chicks of cottonseed meals prepared by several methods, and also of gland-free cottonseed flour, gossypol, and cottonseed pigment glands. For a period of six weeks, one lot of 20 to 30 chicks received a basal diet containing 13 percent of screw-pressed soybean meal, while a similar group was fed experimental diets in which cottonseed meals were substituted for the soybean meal and gossypol and pigment glands were added in measured amounts to the basal soybean diet.

It was found that gland-free cottonseed flour and two types of cottonseed meal (hydraulic-pressed and uncooked diethyl ether-extracted) supported excellent growth. Markedly inferior growth resulted when the experimental diets contained pigment glands or meal extracted with hexane from uncooked cottonseed. Thus it appears that the physiologically deleterious components of unprocessed cottonseed are segregated in the pigment glands.

Pure gossypol added to the diet produced relatively little retardation in growth, and a poor correlation was found between the nutritive value of the various cottonseed products and their content of gossypol and gossypurpurin.

18 BOATNER, Charlotte H.

*PIGMENTS IN COTTONSEED. Chapter VI, pp. 213-363 in Cottonseed and Cottonseed Products, Their Chemistry and Technology ed. by Alton E. Bailey, Interscience Pub., N.Y. (1948).

Significant contributions to the chemistry of cottonseed pigments, their occurrence and behavior in the seed, and their interconversions during processing of the seed are reviewed. A discussion of the chemical and physical properties of gossypol, its derivatives, esters

* This publication not available for distribution.

No.

and ethers is followed by an outline of present knowledge about the more recently discovered gossypurpurin, gossycaerulin and gossyfulvin pigments. Some data is given on pigments such as the flavones and the anthocyanins, carotenoids, chlorophyll, resin pigments, and others of an unidentified nature which have been detected in small amounts. Behavior of the pigments and pigment glands under various methods of processing cottonseed is explained with particular attention to solvent extraction and the recently developed laboratory process of gland flotation. Some possible uses for the cottonseed pigments are indicated.

19 DOLLEAR, F. G., and MARKLEY, K. S.

*MISCELLANEOUS CONSTITUENTS. Chapter IX, pp. 466-93, in Cottonseed and Cottonseed Products, Their Chemistry and Technology ed. by Alton E. Bailey, Interscience Pub., N. Y. (1948).

For the purpose of this discussion the authors divide cottonseed into three main parts -- linters, hulls, and kernels. Since the oil, protein and pigments of the kernels are covered elsewhere in the publication, only the carbohydrates, phosphorus-containing compounds, mineral constituents, nitrogenous constituents other than protein, vitamins, and various minor components of this portion of the seed are included in this chapter. The discussion of linters devotes a section each to cellulose, pectic substance, mineral constituents, nitrogenous constituents, wax and resins, coloring matter, and water-soluble constituents. The analysis of hulls is broken down under hemicelluloses, mineral constituents, lignin, and tannins.

It is pointed out that although considerable data is available concerning the miscellaneous constituents of cottonseed, many merit more intensive and detailed investigations, especially by application of the more recently developed tools and techniques. In addition, it is quite probable that other, as yet undetected, constituents are present in the seed.

20 KARON, M. L., and ADAMS, Mabelle E.

NOTE ON THE HYGROSCOPIC EQUILIBRIUM OF COTTONSEED AND COTTONSEED PRODUCTS. J. Am. Oil Chemists' Soc. 25 (1), 21-2 (1948).

Investigations described in this report are continued from an earlier study published in 1947 (J. Am. Oil Chemists' Soc. 24, 56-8). The previous tests were made on whole cottonseed, cottonseed kernels, and undelintered hulls over a relative humidity range of 31 to 93 percent. The present article describes similar experiments over a moisture range of 11 to 93 percent on whole seed, delintered seed, kernels, linters, and lint-free hulls. Results, summarized in a graph and table, show the equilibrium moisture content of delintered

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* This publication not available for distribution.

seed to be slightly higher than that of whole seed. Linters had the lowest equilibrium moisture content of the various cottonseed products tested.

21 FAN, H. P., MORRIS, J. C., and WAKEHAM, Helmut

DIFFUSION PHENOMENA IN SOLVENT EXTRACTION OF PEANUT OIL. Ind. & Eng. Chem. 40 (2), 195-9 (1948).

The theory of diffusion extraction of oil from a porous solid is examined in the light of previous investigations on solvent extraction of oilseeds. Peanut kernels were prepared and extracted in such a manner as to meet the conditions required by Fick's law. The diffusion coefficient under these conditions varies with solvent and with the moisture content of the oilseeds, but is essentially independent of the thickness of the peanut sections extracted. Results with peanut sections follow the theory closely when the broken cells at the surfaces, and the void spaces due to moisture loss, are taken into consideration. The techniques and conclusions presented may be of assistance in studying extraction from other oilseed systems.

22 MURTI, K. S., and DOLLEAR, F. G.

RICE BRAN OIL. II. COMPOSITION OF OIL OBTAINED BY SOLVENT EXTRACTION. J. Am. Oil Chemists' Soc. 25 (6), 211-13 (1948).

Interest in the recovery of oil from rice bran produced by southern and southwestern mills, and the lack of data on the characteristics and composition of such oil, prompted an analysis of three samples -- two of crude oil and one of refined oil. These oils were obtained by solvent extraction of commercial rice brans from Texas-grown Blue Bonnet and Arkansas-grown Zenith varieties of rice from the 1946 crop. Methods used in making the analysis are outlined, and the results summarized both in tabular and discussion form. Briefly, the glyceride composition of the samples was found to be: 0.80, 1.06 and 0.84 percent linolenic acid; 33.2, 30.6 and 33.1 percent linoleic acid; 45.0, 46.0 and 46.3 percent oleic acid; 17.1, 17.3 and 17.1 percent saturated acids; and 3.9, 5.0 and 2.7 percent unsaponifiable matter, respectively.

23 REDDI, P. B. V., MURTI, K. S., and FEUGE, R. O.

RICE BRAN OIL. I. OIL OBTAINED BY SOLVENT EXTRACTION. J. Am. Oil Chemists' Soc. 25 (6), 206-11 (1948).

Freshly milled rice bran of good quality was extracted with commercial hexane, yielding an oil of relatively low free fatty acid content, with good color, and as stable as other similar types of crude oils. When the temperature was kept below 10° C. and the extraction discontinued at the right time, the recovered oil represented 90 to 95 percent of the total lipids in the bran. It contained very little wax -- about

3 to 9 percent of the total extractable lipids -- and this could be extracted easily with hot commercial hexane and other solvents. It was found that good rice bran oils behave under ordinary refining methods much like cottonseed oils of comparable free fatty acid content. Losses approximating the absolute or Wesson loss resulted from caustic soda refining in a hydrocarbon solvent as well as from refining with sodium carbonate. When bleached in the usual way, some of the refined rice bran oils produced products acceptable for use in the edible trade. The greenish cast caused by the presence of chlorophyll was removed by bleaching with a small amount of activated clay.

24 SINGLETON, W. S.

PHASE INVESTIGATIONS OF FATS. II. SYSTEMS CONTAINING OLEIC AND STEARIC ACIDS AND AN ORGANIC SOLVENT. J. Am. Oil Chemists' Soc. 25 (1), 15-20 (1948).

Purpose of the investigation reported was to determine the composition of the solid and liquid phases existing in equilibrium in the ternary systems oleic acid-stearic acid-acetone, and oleic acid-stearic acid-commercial hexane, at various temperatures, and with varying amounts of the three components. Twelve ternary phase diagrams, constructed from compositional data of the liquid and solid phases in equilibrium at 0° C., -10° C., -20° C., -30° C., and -40° C., make possible prediction of the degree of separation which can be obtained with any given mixture of oleic and stearic acids, using either acetone or commercial hexane as solvent.

The intersolubilizing effect of oleic acid on stearic acid, greater in commercial hexane than in acetone, and the possible formation of mixed crystals of oleic and stearic acid were noted. Oleic acid of high purity can be obtained as one of the practical applications of these data.

25 SWIFT, C. E., DOLLEAR, F. G., BROWN, Lawrence E., and O'CONNOR, R. T.

DECOMPOSITION OF METHYL HYDROPEROXIDO OLEATE. J. Am. Oil Chemists' Soc. 25 (2), 39-40 (1948).

Experiments described in this report indicate that one of the decomposition reactions of methyl hydroperoxido oleate is fission to produce α,β-unsaturated carbonyl compounds, one of which is 2-undecenal. Qualitative evidence of the presence of the decomposition mixture of analogs and homologs of this aldehyde was obtained in the course of the isolation and purification of 2-undecenal. Aldehydes of the type represented by 2-undecenal readily undergo oxidation, reduction, and isomerization, thus making it possible to account for many of the end products which have been qualitatively and quantitatively identified in various types of oxidizing fat systems.

No.

26 SWIFT, C. E., and DOLLEAR, F. G.

THE OXIDATION OF METHYL OLEATE. II. A REACTION BETWEEN METHYL HYDROPEROXIDO OLEATE AND OLEIC ACID. J. Am. Oil Chemists' Soc. 25 (2), 52-3 (1948).

In an investigation of the possibility that a reaction occurs between a fatty acid hydroperoxide and an olefinic fatty acid, advantage was taken of the fact that the separation of products could be facilitated by using the ester of the hydroperoxide as one reactant and a free acid as the other. Results indicate that oleic acid is intermolecularly oxidized by methyl hydroperoxido oleate at 90° C. through the addition of oxygen at the olefinic bond with the formation of epoxy and dihydroxy compounds. Only the low-melting isomeric form of 9,10-dihydroxystearic acid could be isolated from the reaction mixture. The oxidation of olefinic linkages by hydroperoxides appears to account, at least in part, for the observed reduction of unsaturation in autoxidizing fats.

SEE ALSO NOS. 3, 13 and 14.

Miscellaneous

27 REEVES, Richard

METHYL 2,6-DIMETHYL-α-D-GLUCOPYRANOSIDE. J. Am. Chem. Soc. 70 (1), 259-60 (1948).

Preparation of methyl 2,6-dimethyl-α-D-glucoside was undertaken in order to provide an alkali-stable glucopyranoside. The α-glucoside was obtained by two different routes, outlined diagrammatically. Each step of the two methods is discussed in detail. Although the crystalline state of the glucoside was not obtained, the preparations exhibited almost identical rotatory values and gave satisfactory analyses, and it is believed that the α-pyranoside structure persisted in both.

PRESS NOTICES

Oil From Rice. USDA 794-48-2 (Food and Home Notes, p. 2). April 21, 1948.

Use of Rayon Climbs to New Peak in 1947, While Consumption of Other Synthetic Fibers Declines. USDA 1125-48. May 28, 1948.

PATENTS

Process for the Production of Sweetpotato Starch. Gregory, H. Dexter and Francis H. Thurber. U. S. Patent No. 2,443,397. June 22, 1948.

Method of Treating Tire Cord. Howard J. Philipp. U. S. Patent No.2,444,064.. June 29, 1948.

REPUBLICATIONS

HOFFPAUIR, Carroll L., PETTY, Dorothy H., and GUTHRIE, John D.

GERMINATION AND FREE FATTY ACID IN INDIVIDUAL COTTON SEEDS. From Science 106, 344-5 (1947). Republished J. Am. Oil Chemists' Soc. 25 (4), 127-8 (1948).